

ancient beach level of Lake Lahontan. Shells from this region are essentially the same as those from the waters edge, except that there are no blue-black specimens from the upper terrace. (Incidentally, we saw no blue-black shells in Winnemucca Lake.) Except for this detail the resemblance between the two faunas is so great as to justify the conclusion that the one gave rise to the other. But the species in the Lahontan terrace do not occur in Honey Lake, and those in Honey Lake do not occur in the Lahontan terrace. Whether or not this fact should be interpreted to mean that the Honey Lake fauna was introduced at some time after the water level had begun to recede is one whose solution must be held in abeyance until a more detailed conchological survey of the two basins has been made, that will require the cooperation of many workers.

In the preparation of this report we would like to express our gratitude to our cousins, Fisher C. and Margaret F. Baily, of Reno, Nevada, who accompanied us to Lake Tahoe and to Honey Lake, and without whose persistent encouragement the site of the Honey Lake fauna would have eluded us.

GONIOBASIS PROXIMA (SAY)

BY CALVIN GOODRICH

It is practise to call the single *Goniobasis* of mountainous North Carolina *G. proxima* (Say) whether it is in the Tennessee River basin or the more direct drainage to the Atlantic. So far as shell characters offer any clue there is no difference between the forms of one basin and the other. These are of very simple terms, and it might be difficult to imagine further subtraction of features. Yet since as a rule differentiation is marked as between goniobases of southern river systems, and indeed, sometimes within the same system—take the genus in the Coosa, Cahaba and Black Warrior rivers for example—one is pursued by the suspicion that *G. proxima* of the western French Broad and the east-flowing Broad is not identical anatomically.

Support for the suspicion is lent by a consideration of biological relationships. Going down the French Broad, *G. claviformis* (Lea) is met with in side streams and after that *G. sim-*

plex (Say), the three species surely relatives. But the *G. proxima* of streams of the eastern escarpment does not lead to *G. simplex*, but through *G. symmetrica* (Haldeman) to *G. virginica* (Gmelin). This is toward the northeast. The Broad River flowing southeast through South Carolina becomes the Santee. Far down in the Santee is an area occupied by *G. catenaria* (Say), a notably plicate species. Related to this shell is the less plicate *G. dislocata* (Ravenel), a race of which has been found in tributaries of the Broad just about where the true uplands leave off and the Piedmont, so-called, begins. All of which appears to argue that "*G. proxima*" is an end-product of three distinct groups.

It sometimes seems that *G. proxima*, meaning here both eastern and western forms, is merely hanging on, and that the next freshet will carry it away altogether. On the other hand, an occasional colony is made up of innumerable members, two or three in the Catawba of McDowell County, North Carolina, for instance. In a mere field rivulet I have seen individuals so packed together that the bed of the rill was black with them. Returning to the locality after a year, I could see none. While it is odd to think that migration occurred, there were no dead shells present to suggest destruction. Colonies almost as large occupy springs along the French Broad River. The main stream is polluted first by wastes of a tannin factory and then by domestic sewage. In only one place below the factory were the shells come upon, and this was where water of a brook entered and for a few square feet acted as a shield against contamination. No doubt the whole river once had populations of gastropods as, within recent years at least, the shells were abundant at the mouth.

Long ago it was observed that *G. aterina* Lea of the type locality, Cumberland Gap, was a mountain climber. Until the spring it inhabited was to put to use as a community water source, the species covered the rocks of a steep slope five or six hundred feet high. It lived in miniature falls, in spray, often merely on wet stones. The same habit is to be seen in *G. proxima*. It climbs far up in torrents that virtually have no quiet waters. It sometimes goes, in fact, as far up as there is water to let it. Lately, the shell was discovered in the meager flow

from a dripping hillside spring. Connection with the mother stream was cut off by road work except by seepage. The mollusks had lived and reproduced in two or three inches of water for a number of years, and they will disappear if and when an especially dry season comes along, all chance of restoration as a colony having passed. Flood and silt have done for shells in many of the occupied valleys, and of course the mania for building power dams (at government expense) is increasing the speed of annihilation. It may be that in time the shells remaining will be those individuals that have taken to mountain climbing.

The peristome or outer lip of *G. proxima* is very nearly straight except where a shell now and then succeeds in reaching old age. This is what may be expected of mollusks forced to live in a rush of water. The foot of the animal has to cling to the rocks. A crevice such as that formed by an incurved lip would serve as a spot for an entering wedge, as the phrase goes. Now it is a general habit in the genus for juveniles and adolescents to keep to the faster currents, for adults to seek the quieter stations, eddies or the lee of boulders or muddy banks. It is in such spots that old specimens of *G. proxima* are to be found, and that an incurved peristome can, as it were, be afforded.

A note may be added of the *G. catenaria dislocata* aforementioned. Specimens of it came to Lea that he named *G. spartenburgensis*. This was for the town or county of Spartanburg, South Carolina, drained by the Broad River. Search has been made for the shell, but for a hundred years the area has been given over to cotton growing, and no land washes worse than a cotton field. Streams of Iowa look no more evil than do those of the Piedmont. For the clean-living *Goniobasis* existence is denied.

TWO PACIFIC SPECIES OF PHOS

BY JEANNE S. SCHWENGEL

PHOS LANNUMI new species. Pl. 5, fig. 3.

Shell small, of $9\frac{1}{2}$ whorls, over two and one-half times as long as wide. The apex of two and one-quarter embryonic whorls is blunt, smooth and glassy, slightly tipped. The following three whorls are straight-sided, with the last four whorls slightly and